

ABSTRACT

A micromachined actuator including a body or platform mounted to a suspension system anchored to a substrate. In one embodiment, the suspension system is comprised of a set of one or more spring flexures connecting the actuator body to the substrate with strain relief provided via connecting torsional elements. In another embodiment, the suspension system includes a first set of one or more spring flexures each with one end anchored to a largely rigid intermediate frame and the other end attached to the body. A second set of one or more flexures is attached between the intermediate frame and the substrate. A third actuator embodiment maximizes force electrode area to minimize voltage required for electrostatic actuation. A fourth embodiment provides electrical interconnect to an actuator or an actuator array using polysilicon with silicon nitride isolation. Actuators may be fabricated by combining the key features of all four embodiments or actuators may be fabricated using any combination of two or three of the embodiments.